

REMARKS

This is in response to the Office Action dated July 17, 2003. In view of the foregoing amendments and following representations, reconsideration is respectfully requested.

By the above amendment, claims 6, 8-9 and 12-21 are canceled, and claims 22-30 are added. Accordingly, claims 1-5, 7, 10-11 and 22-30 are currently pending in the present application.

Initially, to facilitate the Examiner's reconsideration of the application, the specification and abstract have been reviewed and revised in order to make a number of minor clarifying and other editorial amendments.

In the previous Office Action, claims 6, 8 and 9 are objected to as being dependent upon a rejected claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Accordingly, claims 6, 8 and 9 have been rewritten as new independent claims 22, 25 and 28, respectively. In view of the above, it is submitted that new claims 22-30 are clearly allowable over the prior art of record.

Furthermore, claim 1 has been amended to more clearly define the novel features of the present invention. Thus, it is submitted that independent claim 1 is also allowable over the applied prior references as will be demonstrated below.

The present invention, as defined in claim 1, is directed a method of connecting display panel substrates and requires the following operations:

(1) aligning the positions of and holding a first substrate and a second substrate whereon sealant material is disposed so as to form a waste region in an inner side region of the edges of the first and second substrates;

(2) inserting a spacer having a thickness substantially equal to a prescribed cell gap in the waste region between the first and second substrates;

(3) setting the cell gap with the spacer by pressing the first and second substrates;

(4) hardening the sealant material; and

(5) withdrawing the spacer.

By the above defined method, the following advantageous effects are obtained. Since the sealant material is hardened after the cell gap between the two substrates has been adjusted and determined by the spacer, which has a thickness substantially equal to a prescribed cell gap in a waste region between the first and second substrates, it is possible to readily set the cell gap correctly with a high degree of accuracy.

Ishihara (U.S. Patent No. 5,263,888) discloses successive steps of:

forming a sealing member 3 on at least one of respective electrode surfaces of a pair of substrates 1a, 1b;

forming at least one drop of a liquid crystal material upon at least one of the electrode surfaces;

superposing one of the substrates upon the other one of the substrates with the respective electrode surfaces disposed mutually opposing, under a condition of reduced ambient air pressure;

adjusting the lateral position of the pair of substrates under a condition of normal atmospheric air pressure; and

executing the process of hardening the sealant members.

In the Ishihara method, spacer members 5a, 5b are inserted between the substrates, and when air is evacuated from the vacuum chamber 7, the spacer members are removed so that the substrate 1a becomes superposed on the substrate 1b (see col. 4, lines 41-66). Note that col. 5, line 67 to col. 6, lines 1-14 indicate that the gap is controlled by accurately controlling the amount of liquid that is dropped onto the substrate 1b in the step shown in Fig. 3(a).

Clearly, the Ishihara references does not disclose or suggest that the cell gap between the two substrates is determined by a spacer having a thickness that is substantially equal to a prescribed cell gap in a waste region between the first and second substrates. Accordingly, the Ishihara method can not attain the above-described advantages that are achieved by the method defined in claim 1 of the present invention.

Murouchi (U.S. Patent No. 6,036,568) is directed to a method which includes the steps of;

arranging first and second substrates so as to face each other, a sealing material is provided between the first and second substrates, and the sealing material surrounds a display region in which a plurality of spacers are provided; and

aligning peripheral portions of the first and second substrates by moving at least one of the first and second substrates which have been panel aligned with each other, while a display region of at least one of the first and second substrates is deflected so as to go away from a display region of the other substrate.

Murouchi, however, does not disclose or suggest that the cell gap between the two substrates is determined by a spacer having a thickness that is substantially equal to a prescribed cell gap in a waste region between the first and second substrates, as required in claim 1. Accordingly, the Murouchi method can not achieve the above-described advantages which are realized with the method of the present invention as defined in claim 1.

Wakita (U.S. Patent No. 5,307,190) discloses a method which includes the steps of:

coating an ultraviolet-curable sealant on a peripheral portion of at least one of the substrates so that the sealant encircles a display region;

uniformly distributing a given amount of a liquid crystal over the second substrate; and

bonding and pressing the substrates in a vacuum chamber, and applying ultraviolet rays to the sealant, thereby hardening the sealant.

However, the Wakita reference does not disclose or suggest that the cell gap between the two substrates is determined by a spacer having a thickness that is substantially equal to a prescribed cell gap in a waste region between the first and second substrates. Accordingly, the advantages of the present invention, as defined in claim 1, can not be attained by employing the method disclosed in Wakita.

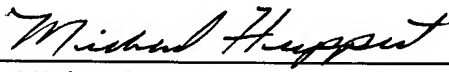
As described above, it is clear that the collective teachings of the applied references do not disclose or suggest that the cell gap between the two substrates is adjusted and determined by a spacer having a thickness that is substantially equal to a prescribed cell gap in a waste region between the first and second substrates. Therefore, it is submitted that the inventive method, defined in amended claim 1, is not rendered obvious by the teachings of the applied prior art references.

In view of the above, it is submitted that the present application is now clearly in condition for allowance. The Examiner therefore is requested to pass this case to issue.

In the event that the Examiner has any comments or suggestions of a nature necessary to place this case in condition for allowance, then the Examiner is requested to contact Applicant's undersigned attorney by telephone to promptly resolve any remaining matters.

Respectfully submitted,

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